

2012 University Alliance Design Competition

2012 Categories

#1 – Novel Design

This category encourages unique and innovative designs that utilize SUMMiT V's strengths.

#2 – MEMS Educational Design

This category emphasizes unique structure design and its use as an educational tool for MEMS or science education.

Judging Criteria: Design submissions in each category will be evaluated using three criteria which will be weighted in calculating the final score as shown below:

Novel Design Judging Criteria

- Uniqueness of design (novel sensing/transduction mechanisms, actuators, device structures, etc) 50%
- Use of SUMMiT V specific strengths (multiple layers, flatness, component libraries, etc) 20%
- Communication of results (effectiveness of communicating device operation, adherence to white paper criteria, modeling, theory, uniqueness, advantages, etc through text, figures, and tables) 30%

MEMS Education Design Judging Criteria

- Usefulness of design for educational demonstrations. Develop lesson or demonstration plan describing how MEMS device will be used for educational purposes. Include details such as target audience and theories/phenomenon you are using MEMS device to demonstrate. 50%
- Use of SUMMiT V specific strengths (multiple layers, flatness, component libraries, etc) 20%
- Communication of results (effectiveness of communicating device operation, adherence to white paper criteria, modeling, theory, uniqueness, advantages, etc through text, figures, and tables) 30%

White Paper Criteria

Note: Adherence to report length restrictions and attention to proper grammar and spelling will be considered during the judging process. Only appendix figures and tables referred to in the first seven pages will be considered during the judging process.

- Topic is limited to the single device within the module submitted for judging for the competition.
- White paper text is limited to seven pages using Times New Roman 12 pt font.
- No limit to number of figures and tables. Must use Arial 10 pt font for all figure and table captions. Locate all figures and tables in the appendix.
- White paper will be the only judgment vehicle. AutoCAD file is for reference and fabrication purposes only.
- Submit white paper in PDF format.

The white paper included in the design submission package should follow the journal paper format outlined below:

Section I:	Abstract (250 word limit)
Section II:	Objective
Section III:	Introduction <ul style="list-style-type: none">• Describe known state of the art• How will your design, structure and/or method be different?
Section IV:	Description <ul style="list-style-type: none">• Describe overall design, components, and expected results.• Specifically describe unique aspects and include 3D pictures.• Comment on how the design exploits strengths of SUMMiT V.• Comment on the usefulness of your design for educational demonstrations.
Section V:	Principle of Operation <ul style="list-style-type: none">• Describe waveforms required and the timing of events including sequence.• Describe measurements you will make when running the device (examples: voltage, current, optical – microscope or interferometer).
Section VI:	Modeling <ul style="list-style-type: none">• Provide reasonable modeling and/or calculations to support novel elements of the design (examples: force calculations, kinematics emulation, thermal effect calculations, electrostatic calculations, frequency response, electrical calculations, structural calculations, etc.
Section VII:	Summary
Section VII:	Appendix

Rules

Competitors must be current members of the University Alliance Program.

Each Alliance School may enter up to two modules (one per category) with up to 1/3 of the module area available for design submitted by professor (professor's design will not be judged).

Each competing university must identify a lead student per category entered.

Competitors must select one device to be judged from each module submitted. The device must be clearly marked and enclosed with a box drawn on the construction layer.

The presubmission checklist and a peer review using SUMMiT V design review guidelines must be completed prior to design submission.

Designs must pass the Design Rule Checker. Requests for DRC error or advisory rule exemptions must be submitted to drt@drc.sandia.gov prior to the submission deadline.

Design must be contained within standard 2820μ x 6340μ module size. If intending to package die, please indicate so on your Intent to Submit email.

Contestants will be required to grant to Sandia Corporation, operator of Sandia National Laboratories, the right, license and permission under patent, copyright or other intellectual or industrial property right to make, use, sell, distribute, perform, modify, reproduce and display any and all designs, drawings, or other materials submitted to Sandia by whatever means. Sandia will only accept original designs created by students with the assistance of their professors. No professional design submissions will be accepted for this student contest. Sandia may distribute parts created by design submissions to other University Alliance members.

Awards

Winning designs and Honorable Mentions from both categories will be fabricated on Sandia's May 2012 reticle set and each winning school will receive a selection of their MEMS fabricated parts for use in their curriculum.

Participants from both categories will be invited to visit Sandia to present their design to Sandia's design review team, meet with MEMS experts, and tour the facilities pending SNL approval.

All UA school regardless of participating in competition will receive Sandia designed UA661 released parts.

The first place team from each category will receive a one year organizational membership to MANCEF. This is normally \$2000/year and will include 5 individual memberships to MANCEF, a copy of MANCEF's 1st and 2nd edition roadmap, discounts, and more. www.mancef.org

MANCEF will also award a plenary speaking slot at COMS2012 to be held in Norway for each category winner if the winner can adapt the research presentation to make it commercialization-oriented.